NORTH CAROLINA DIVISION OF AIR QUALITY

Application Review

Issue Date: xx/xx/2020

Region: Winston-Salem Regional Office
County: Davidson
NC Facility ID: 2900373
Inspector's Name: Dylan Wright
Date of Last Inspection: 08/06/2019
Compliance Code: 3 / Compliance - inspection

Facility Data

Applicant (Facility's Name): Davidson County Municipal Solid Waste Landfill

Facility Address:
Davidson County Municipal Solid Waste Landfill
1160 Old US Highway 29
Thomasville, NC 27360

SIC: 4953 / Refuse Systems
NAICS: 562212 / Solid Waste Landfill

Facility Classification: Before: Title V **After:** Title V
Fee Classification: Before: Title V **After:** Title V

Permit Applicability (this application only)

SIP: 15A NCAC 02D .0516, .0521 .0524, .1110, .1111, .1806
NSPS: Subpart XXX
NESHAP: 40 CFR 61, Subpart M; 40 CFR 63, Subparts ZZZZ and CCCCCC
PSD: N/A
PSD Avoidance: N/A
NC Toxics: N/A
112(r): N/A
Other: N/A

Contact Data

Facility Contact	Authorized Contact	Technical Contact
Steven Sink Operations Manager (336) 240-0666 1242 Old Highway 29 Thomasville, NC 27360	Casey Smith Davidson County Manager (336) 242-2200 P.O. Box 1067 Lexington, NC 27293	Charlie Brushwood Solid Waste Director (336) 240-0303 1242 Old Highway 29 Thomasville, NC 27360

Application Data

Application Number: 2900373.18A, 2900373.19A
Date Received: 12/05/2018, 10/21/2019
Application Type: Renewal/Modification
Application Schedule: TV-Renewal

Existing Permit Data
Existing Permit Number: 10408/T00
Existing Permit Issue Date: 09/15/2015
Existing Permit Expiration Date: 08/31/2020

Total Actual emissions in TONS/YEAR:

CY	SO2	NOX	VOC	CO	PM10	Total HAP	Largest HAP
2018	---	---	4.81	---	---	2.86	1.09 [Toluene]
2017	---	---	4.14	---	---	2.46	0.9365 [Toluene]
2016	---	---	3.53	---	---	2.10	0.7990 [Toluene]
2015	---	---	8.42	---	---	2.19	0.8330 [Toluene]

Review Engineer: Joshua L. Harris

Review Engineer's Signature: **Date:**

Comments / Recommendations:
Issue 10408/T01
Permit Issue Date: xx/xx/2020
Permit Expiration Date: xx/xx/2025

1. Purpose of Application

The Davidson County Municipal Solid Waste Landfill is an active Municipal Solid Waste (MSW) landfill located in Thomasville, Davidson County, North Carolina. This permitting action covers the following applications:

- Application No. 2900373.18A – This application was made for a 1-Step Significant Modification to the landfill's Title V air permit to include conditions for the recently triggered NSPS Subpart XXX. The application was received on December 5, 2018 and was administratively considered complete on that date. Multiple addendums were submitted to amend the application to include information regarding applicability of NESHAP regulations, to submit necessary information required for toxics modeling, and to request the addition of emission sources discovered during a recent inspection.
- Application No. 2900373.19A – This application is being made for renewal of the landfill's current Title V Air permit. The application was received on October 21, 2019 and was considered complete on that date.

These applications will be consolidated under Application No. 2900373.19A and will go through the 30-day public notice and 45-day EPA review periods prior to issuance.

The facility contact for this application is Charlie Brushwood, Solid Waste Director, (phone: 336-240-0303). A consultant, Smith Gardner, Inc. (S+G), was used for this application. The contact at S+G is Matt Lamb, Senior Scientist, (phone: 919-828-0577 ext.121).

2. Facility Description

The Davidson County MSW Landfill currently operates under Solid Waste Permit No. 29-06. The entire MSW landfill is comprised of four sites consisting of two unlined sites known collectively as the Holly Grove site, the closed Phase 1 site, and the active Phase 2 site. A voluntary landfill gas collection and control system (GCCS) has been installed, covering all four areas of the landfill, for collection and subsequent beneficial use of the gas for energy production. The collected gas is sent to a third-party landfill gas-to-energy (LFGTE) facility, Davidson Gas Producers, LLC (Facility ID 2900359, Permit No. 10059) which owns and operates a landfill gas-fired engine rated at 2,233 HP with an LFG flow rate of 540 SCFM, and a flare with a rated flow rate of 900 SCFM. The LFGTE site is located nearby on land leased from Davidson County, and the landfill does not exercise any control over the engine nor the flare.

The facility also operates a diesel-fired leachate pump (ID No. ES-2), which operates as needed after rain events to transfer leachate from a leachate pond to trucks for treatment.

3. Application Chronology

10/10/18 Design Capacity and NMOC Emission Rate Reports, dated October 10, 2019, received by DAQ.

12/05/18 The Division of Air Quality (DAQ), Raleigh Central Office (RCO), received the application for a significant permit modification, Application No. 2900373.18A. The application contained the required forms, and there was no request for confidentiality. The application appeared to be complete for processing.

12/07/18 RCO sent the facility a letter acknowledging receipt of the permit application.

12/13/18 A copy of the permit application was forwarded to the Winston Salem Regional Office (WSRO).

12/20/18 WSRO provided comments on the permit application.

02/13/19 Joshua Harris sent Cybele Brockmann, Staff Engineer with S+G, an email requesting information on individual contributions of the landfill units for use in the dispersion model for toxics.

02/14/19 Cybele Brockmann responded with the percentage that each landfill area contributes to the total emission rate.

02/15/19 Joshua Harris received a phone call from Matt Lamb, Senior Scientist with S+G, who had questions regarding the toxics modeling, and options for modeling increased emission rates above those initially requested. Mr. Harris stated that there are circumstances under which DAQ has "optimized" emission rates but was unsure if this situation was eligible. He pointed Mr. Lamb to Tom Anderson, AQAB Supervisor, for the answer to that specific question.

02/19/19 Matt Lamb sent an email to Joshua Harris and Tom Anderson requesting that the DAQ use the maximum possible emission rate for modeling of toxic air pollutants from the landfill. Mr. Harris replied with a response from Mr. Anderson stating that DAQ will not "optimize" emission rates in these cases, but that Mr. Lamb can request a specific emission rate to be modeled and must resubmit the appropriate application forms to do so.

02/20/19 Joshua Harris spoke with Matt Lamb regarding toxics modeling at the landfill. Mr. Lamb stated that he intends to submit an amendment to the application to request different emission rates be modeled for the facility.

02/21/19 Joshua Harris sent an email to Cybele Brockmann and Matt Lamb requesting additional information for the permit application. Specifically, Mr. Harris asked that the mismatch between the facility's projected emissions and emissions reported on the annual AQEI, and applicability of 40 CFR 61, Subpart M.

03/19/19 Joshua Harris received an email from Matt Lamb with answers to previously asked questions. Mr. Lamb stated that the landfill will be making a request to remove toxics conditions from the permit due to applicability of 40 CFR 61, Subpart M, and the exemption allowed under 15A NCAC 02Q .0702(a)(27)(A).

03/29/19 RCO received a request to remove the toxics provisions from the permit due to the applicability of 40 CFR 61, Subpart M. Updated E1 and E5 forms were included.

04/11/19 Joshua Harris sent an email to Matt Lamb regarding the status of Tier 2 testing. Cybele Brockmann responded stating that the sample has been collected, and S+G are waiting on lab results.

04/17/19 Joshua Harris spoke with Cybele Brockmann requesting updated application forms to correct contact information. Also discussed were the calculations for the toxics modeling regarding the percentage of the total emissions contributed by each site, and Tier 2 sample result submittal.

04/18/19 Received information needed to complete toxics modeling.

04/24/19 RCO received an updated "A" Form to correct contact information.

04/25/19 WSRO received the landfill's Tier 2 test results and forwarded a copy to RCO for review.

05/01/19 Nancy Jones completed air dispersion modeling for toxic air pollutants.

07/10/19 SSCB completed review of the landfill's Tier 2 test.

07/16/19 Joshua Harris sent electronic copies of the draft permit and review documents to Booker Pullen, Samir Parekh, Davis Murphy, and Dylan Wright for comments.

07/19/19 Samir Parekh responded with no comments.

07/22/19 Dylan Wright responded with editorial comments.

07/23/19 Booker Pullen responded with editorial comments.

07/24/19 Joshua Harris sent electronic copies of the draft permit and review documents to Zeb Hanner, Charlie Brushwood, and Cybele Brockmann for comments.

08/06/19 Dylan Wright conducted a compliance inspection at the landfill and discovered additional sources. Mr. Wright discovered two 10,000-gallon diesel fuel storage tanks, and a 2,000-gallon gasoline storage tank. He was also informed that the leachate storage tank's capacity is 343,000 gallons as opposed to 330,000 gallons.

08/08/19 Joshua Harris received an email from Dylan Wright regarding the emission sources discovered during the inspection. Additionally, Mr. Harris received an email from Matt Lamb, who asked why the facility's permit was not renewed as part of the modification.

08/09/19 Joshua Harris responded to Matt Lamb's email stating that the application requested modifications only and did not indicate a request that the permit be renewed. Mr. Harris stated that a second application requesting renewal would need to be submitted if the landfill intended to have the permit renewed ahead of schedule. Mr. Harris also requested that Mr. Lamb submit any information regarding updating the insignificant/exempt activities discovered during the recent inspection.

Later, Mr. Harris spoke with Dylan Wright who stated that a diesel-fired pump was also discovered at the facility and that it is used to pump leachate from a leachate pond into tankers after rain events. Mr. Wright stated that even though the engine is skid-mounted, he learned that it has remained in place for longer than 12 months, so it is now considered as a stationary source.

Mr. Harris then received an email from Cybele Brockmann regarding the renewal application. Ms. Brockmann listed the application forms she would be submitting and asked if any other items were required. Mr. Harris replied stating that the application also needed to include an "E5" form certifying compliance. Mr. Harris also asked that Ms. Brockmann verify the capacities of the newly discovered sources and requested additional information on the diesel-fired leachate pump that might help determine the classification of the engine and any applicable requirements.

08/13/19 Through 08/15/19 Cybele Brockman provided fuel purchase information for the gasoline storage tank indicating that the tank's throughput is less than 10,000 gallons per month. Additionally, multiple emails were exchanged regarding the leachate pump engine size, and renewal application.

08/20/19 Notice of Deficiency (NOD) issued by the WSRO for operating the diesel-fired leachate pump without a permit.

10/21/19 Received Application No. 2900373.19A submitted for renewal. The modification application No. 2900373.18A will be consolidated and processed with the renewal.

10/22/19 Joshua Harris sent Mary Kennamer, Staff Engineer with S+G, an email regarding the leachate pump, and potential modeling for benzene emissions. Mr. Harris attached a copy of NCGS 143-215.107 for the facility's consideration. Ms. Kennamer responded with the request to have DAQ conduct modeling for the leachate pump. Mr. Harris supplied Ms. Kennamer with electronic copies of the "D3" forms required for DAQ to conduct the modeling.

10/23/19 The facility responded to the NOD and included updated application forms to include the leachate pump as part of the modification application (No. 2900373.18A). This submittal resolved the NOD.

10/23/19 Joshua Harris sent a follow-up email to Mary Kennamer requesting information regarding the status of previous requests for information made Ms. Brockman was managing the application project. Ms. Kennamer responded and supplied a copy of the "D4" form including information on the facility's insignificant sources. Ms. Kennamer also stated that she was waiting on information form the engine vendor in order to submit information required for modeling for the leachate pump.

01/17/20 Joshua Harris sent a follow-up email to Matt Lamb requesting information regarding the status of previous requests made when Ms. Kennamer was managing the application project. Mr. Lamb responded stating that he still needed information from the pump manufacturer, but that he expected to have it soon.

01/20/20 Matt Lamb sent Joshua Harris an email with a copy of the requested "D3" forms containing information necessary to complete modeling for toxic emissions from the leachate pump engine.

01/22/20 Nancy Jones completed the updated dispersion modeling for toxic air pollutants; there were no changes to the modeled impacts.

01/23/20 Joshua Harris sent electronic copies of the updated draft permit and review documents to Booker Pullen and Lisa Edwards for comments.

01/29/20 Dylan Wright provided minor editorial comments.

01/30/20 Booker Pullen provided minor editorial comments.

01/30/20 Joshua Harris sent electronic copies of the updated draft permit and review documents to Zeb Hanner, Charlie Brushwood, and Matt Lamb for comments.

The drafts were returned as undeliverable as Mr. Hanner appeared to no longer be the County Manager.

Mr. Harris sent Mr. Lamb a follow-up email regarding the apparent change to the Responsible Official and included a copy of the "Form A" needed to update the facility's contact information.

02/11/20 RCO received the "Form A" with updated contact information for the landfill. Casey Smith is the recently appointed County Manager and new Responsible Official for the landfill.

02/12/20 Joshua Harris sent electronic copies of the updated draft permit and review documents to Casey Smith, Charlie Brushwood, and Matt Lamb for comments.

02/25/20 Joshua Harris sent a follow-up email to Matt Lamb regarding the status of any comments from the facility. Mr. Lamb replied with a question about the condition requiring design capacity reports and a question regarding the permit shield. Mr. Harris responded stating that since the landfill has exceeded the mass and volume thresholds of NSPS XXX, no further design capacity reporting is required, so the condition being questioned will be removed from the draft. Mr. Harris also provided clarification on the MACT AAAA permit shield.

Mr. Harris asked Mr. Lamb to verify that the facility has no questions or comments before sending the drafts to notice.

03/04/20 Mr. Harris sent Casey Smith an email following-up on the request for comments. Mr. Smith replied, indicating that the County had no additional comments.

Xx/xx/20 30-day public notice and 45-day EPA review periods begin.

Xx/xx/20 Public notice period ends; [comments received.]

Xx/xx/20 EPA review period ends; [comments received.]

Xx/xx/20 Air Quality Permit Revision No. 10408T01 issued.

4. Table of Changes to Existing Permit No. 10408T00

Page No.	Section	Description of Changes
Cover and Throughout	Cover and Throughout	• Updated to latest DAQ letterhead. • Updated name of Responsible Official. • Updated permit revision numbers and dates. • Updated PSD increment tracking statement.
Attachment to Cover	Attachment to Cover	• Removed word "Subpart" from GACT applicability citations and moved citations to the Emission Source ID column. • Added leachate, diesel fuel, and gasoline storage tanks as ID Nos. IES-5, IES-6, IES-7, IES-8, and IES-9. • Updated URL for DAQ MACT/GACT guidance website.
2	Contents	• Updated permit Section 2 listings.
3	1 (Table)	• Removed NSPS WWW citation. • Added NSPS XXX citation. • Added 40 CFR 61, Subpart M citation. • Added diesel-fired leachate pump as a permitted source (ID No. ES-2).
3	2.1 A (Table)	• Updated NMOC threshold to 34 Megagrams per year and updated regulatory citation for NSPS XXX. • Added row and summary of standard for asbestos and applicability of 40 CFR 61, Subpart M. • Removed row for toxic air pollutants. • Updated row for odorous emissions to cross reference the new permit Section 2.2 A.1.
3-7	2.1 A.1.	• Removed condition for NSPS WWW. • Added condition for NSPS XXX.
7-8	2.1 A.2.	• Removed permit condition for 15A NCAC 02D .1806 and relocated it to Section 2.2 A.1. • Added permit condition for 15A NCAC 02D .1110 for 40 CFR 61 Subpart M.
---	---	• Removed 15A NCAC 02Q .0711 Toxics condition since the landfill is exempt from permitting for toxic air pollutants per 15A NCAC 02Q .0702(a)(27)(A).
9-11	2.1 B.1. 2.1 B.2. 2.1 B.3.	• Inserted new Permit Section 2.1 B. for the diesel-fired leachate pump. • Inserted permit conditions for 15A NCAC 02D .0516, 02D .0521, and 02D .1111 as they apply to the leachate pump.
11	2.2 A.1.	• Inserted new Permit Section 2.2. • Relocated permit condition for 15A NCAC 02D .1806 to this section.
11	2.3	• Removed unused Permit Section and renumbered Permit Shield section as Section 2.3.
12-21	3	• Updated General Conditions to latest version (version 5.3).

5. Changes in Equipment

- Added diesel-fired leachate pump as a permitted emission source (ID No. ES-2).
- Added 330,00-gallon leachate storage tank as an insignificant source (ID No. IES-5).
- Added 1,000-gallon diesel fuel storage tank as an insignificant source (ID No. IES-6).
- Added 10,000-gallon diesel fuel storage tank as an insignificant source (ID No. IES-7).
- Added 10,000-gallon diesel fuel storage tank as an insignificant source (ID No. IES-8).
- Added 2,000-gallon gasoline storage tank as an insignificant source (ID No. IES-9).

Title V Equipment Editor (TVEE) is up to date for the changes listed above.

The facility's permitted emission sources are as follows:

Emission Source ID No.	Emission Source Description	Control Device ID No.	Control Device Description
ES-1 NSPS XXX 40 CFR 61 Subpart M	Municipal Solid Waste Landfill	CD-GCCS-1 CD-1	Landfill gas collection system Landfill gas-fired utility flare (900 scfm maximum flow rate)
ES-2 GACT ZZZZ	Diesel-fired leachate pump (80 hp)	N/A	N/A

The facility's insignificant/exempt activities are as follows:

Emission Source ID No.	Emission Source Description
IES-1 GACT ZZZZ	Diesel fuel-fired emergency generator (25 kW)
IES-2 GACT ZZZZ	Diesel fuel-fired emergency generator (25 kW)
IES-3	Waste oil heater (less than 0.5 million Btu per hour heat input)
IES-4	Waste oil heater (less than 0.5 million Btu per hour heat input)
IES-5	Leachate storage tank (330,000-gallon capacity)
IES-6	Diesel fuel storage tank (1,000-gallon capacity)
IES-7	Diesel fuel storage tank (10,000-gallon capacity)
IES-8	Diesel fuel storage tank (10,000-gallon capacity)
IES-9 GACT CCCCCC	Gasoline storage tank (2,000-gallon capacity)

6. NSPS, NESHAP, PSD, 112(r), CAM & Attainment Status

- **NSPS** –

  - The MSW Landfill (ID No. ES-1) is subject to 40 CFR 60, Subpart XXX "Municipal Solid Waste Landfills that Commenced Construction, Reconstruction or Modification After July 17, 2014," due to the recent construction of the Phase 3, Area 3 lateral expansion.

  - The MSW Landfill (ID No. ES-1) is NOT subject to 40 CFR 60, Subpart WWW "Municipal Solid Waste Landfills," since it is superseded by NSPS Subpart XXX.

  - The diesel-fired emergency generators and leachate pump (ID Nos. IES-1, IES-2, and ES-2) are NOT subject to 40 CFR 60, Subpart IIII "Stationary Compression Ignition Internal Combustion Engines" because the construction dates are prior to the applicability date of the NSPS regulation.

- **NESHAP** –

  ✓ The MSW Landfill (ID No. ES-1) is NOT subject to 40 CFR 63, Subpart AAAA "Municipal Solid Waste Landfills." While the landfill's mass and volume exceed the 2.5 million Mg and 2.5 million m^3 thresholds, the landfill's NMOC emission rate is less than 50 Mg/yr, and it is not collocated with a Major Source of HAPs.

  ✓ The MSW Landfill (ID No. ES-1) is subject to 40 CFR 61, Subpart M "National Emission Standard for Asbestos," since it is an active asbestos-containing waste disposal site.

  ✓ The diesel-fired leachate pump (ID No. ES-2) is subject to 40 CFR 63, Subpart ZZZZ, "Reciprocating Internal Combustion Engines" and is considered as an existing non-emergency engine under this regulation.

  ✓ The diesel-fired emergency generators (ID Nos. IES-1, IES-2) and the non-emergency leachate pump (ID No. ES-2) are subject to 40 CFR 63, Subpart ZZZZ "Reciprocating Internal Combustion Engines" and are considered as existing emergency engines under this regulation.

  ✓ The gasoline storage tank (ID No. IES-9) is subject to 40 CFR 63, Subpart CCCCCC "Gasoline Dispensing Facilities" since the facility is an area source of HAPs, and the facility meets the definition of a gasoline dispensing facility as any stationary facility which dispenses gasoline into the tank of a motor vehicle, motor vehicle engine, nonroad vehicle, or nonroad engine, including a nonroad vehicle or nonroad engine used solely for competition. Gasoline storage tanks are listed as affected sources under §63.11111(a), and there are no size distinctions.

  Since IES-9 is an insignificant activity, there is no permit condition, however the facility is still required to comply with Subpart CCCCCC. The facility has the general duty to minimize emissions by operating and maintaining affected sources, and their associated air pollution control and monitoring equipment, in a manner consistent with safety and good air pollution practices for minimizing emissions. In addition, since the facility's throughput is expected to be less than 10,000 gallons per month, based on recent purchase information provided by the facility's consultant, the facility is subject to the requirements of §63.11116.

This section states that the facility must handle the gasoline in a manner which will not result in vapor release to the atmosphere for an extended period of time. Measures to be taken include, but are not limited to:

- Minimize gasoline spills;
- Clean up spills as expeditiously as practicable;
- Cover all open gasoline containers and all gasoline storage tank fill-pipes with a gasketed seal when not in use; and
- Minimize gasoline sent to open waste collection systems that collect and transport gasoline to reclamation and recycling devices.

There are no notification or reporting requirements for facilities with a throughput of less than 10,000 gallons per month, however, the facility shall supply records of gasoline throughput within 24 hours of a request by DAQ. Additionally, should the facility's monthly gasoline throughput exceed 10,000 gallons, the facility will be subject to the requirements of §63.11117 for facilities with a monthly throughput of 10,000 gallons of gasoline or more, or §63.11118 for facilities with a monthly throughput of 100,000 gallons of gasoline or more, whichever is applicable, and must meet the applicable notification, testing, monitoring, recordkeeping, and reporting requirements. If an affected source's throughput ever exceeds an applicable throughput threshold, the affected source will remain subject to the requirements for sources above the threshold, even if the affected source throughput later falls below the applicable source threshold. [§63.11111(i)]

- **PSD –** The facility's potential emissions do not exceed PSD permitting thresholds.

  ✓ Davidson County has triggered increment tracking under PSD for $PM_{2.5}$, PM_{10}, and NOx. The following increments are consumed as a result of this modification:

Pollutant	Increase due to inclusion of ES-2 lb/hr
$PM_{2.5}$	0.20
PM_{10}	0.20
NOx	2.83

- **112(r) –** The facility does not store any of the listed 112(r) chemicals in amounts that exceed the threshold quantities. Therefore, the facility is not required to maintain a written Risk Management Plan (RMP).

- **CAM –** CAM does not apply to this facility since the facility's emission sources are subject to NSPS and NESHAP standards that were promulgated after November 15, 1990.

- **Attainment status** – Davidson County is in attainment for all criteria pollutants.

7. Regulatory Review

The following permit conditions are being removed as part of this permit application:

- 15A NCAC 02D .0524: New Source Performance Standards, 40 CFR 60, Subpart WWW
- 15A NCAC 02Q .0711: Emission Rates Requiring a Permit

The facility is subject to the following air quality regulations in addition to the General Conditions:

- 15A NCAC 02D .0516: Sulfur Dioxide Emissions from Combustion Sources
- 15A NCAC 02D .0521: Control of Visible Emissions
- 15A NCAC 02D .0524: New Source Performance Standards, 40 CFR 60, Subpart XXX
- 15A NCAC 02D .1110: National Emission Standards for Hazardous Air Pollutants, 40 CFR 61, Subpart M
- 15A NCAC 02D .1111: Maximum Achievable Control Technology, 40 CFR 63, Subpart ZZZZ
- 15A NCAC 02D .1806: Control and Prohibition of Odorous Emissions

15A NCAC 02D .0516: Sulfur Dioxide Emissions from Combustion Sources
The facility's combustion sources are the subject sources. All engines located at this facility are diesel-fired. SO_2 emissions from these sources shall not exceed 2.3 lb/mmBtu heat input. The AP-42 Chapter 3.3-1 emission factor for SO_2 is 0.29 lb/mmBtu. Compliance is expected.

15A NCAC 02D .0521: Control of Visible Emissions
The diesel-fired leachate pump (ID No. ES-2) is the subject source. Visible emissions from this source shall not exceed 20% opacity when averaged over a six-minute period. Visible emissions from this source has not been evaluated, however there are typically no visible emissions concerns from these types of sources outside of possibly brief visible emissions immediately upon startup. Compliance is expected.

15A NCAC 02D .0524: New Source Performance Standards, 40 CFR 60, Subpart XXX
As previously stated, the MSW landfill (ID No. ES-1) recently became subject to 40 CFR 60, Subpart XXX. NMOC emissions were calculated using the Tier 2 methodology and are below the 34 Mg/yr threshold which would require installation and operation of a GCCS. The facility does have a voluntary GCCS installed, which collects gas that is then routed to a separate LFGTE facility, Davidson Gas Producers, LLC (Facility ID 2900359). Davidson Gas Producers owns and operates an open flare and an LFG-fired generator under air quality Permit No. 10059.

A permit condition for NSPS Subpart XXX will be included in this permit revision. The facility is required to continue making demonstrations for the annual NMOC emission rate, keep appropriate records, and submit periodic reports. Upon exceeding the 34 Mg/yr threshold for NMOC emissions, the landfill will trigger the requirements to submit a GCCS design plan for approval, and subsequently install and operate the GCCS. Continued compliance is expected.

Additionally, the existing 15A NCAC 02D .0524 permit condition for NSPS Subpart WWW will be removed as it is no longer applicable.

15A NCAC 02D .1110: National Emission Standards for Hazardous Air Pollutants, 40 CFR 61, Subpart M

The facility is an active disposal site for asbestos-containing wastes; therefore, it is subject to the requirements of this regulation. To comply, the facility must adhere to a general set of work practices which may include ensuring there are no visible emissions at the disposal site, covering waste daily with at least six inches of compacted non-asbestos material or use another dust suppression agent, or the landfill may propose alternative methods for DAQ approval. The facility will be required to post signage and barriers if the method of compliance does not include covering the asbestos-containing waste. Closed portions of the landfill which have previously received asbestos-containing waste are also subject and are required to comply with the requirements of 40 CFR 61.151 for inactive waste disposal sites. The facility's current Solid Waste permit contains a requirement for the facility to comply with the requirements of 40 CFR 61, Subpart M, and continued compliance is expected.

15A NCAC 02D .1111: Maximum Achievable Control Technology, 40 CFR 63, Subpart ZZZZ

The facility's diesel-fired leachate pump (ID No. ES-2) is the permitted source subject to this regulation. The engine was previously considered portable but has been used in place for more than 12 months, therefore it is now considered a stationary source. The engine was manufactured in 2002, so it is an existing, non-emergency engine, located at an area source of HAPs with a site rating less than 300 HP. For compliance, the facility shall meet the requirements of Table 2d in addition to maintaining and operating the engine according to the manufacturer's written instructions. The facility may also opt to use an oil analysis program to extend the oil change requirement of Table 2d.

There are no operating limitations, no fuel requirements, no test requirements, and no notification requirements for this source. However, the facility must operate the engine in a manner consistent with safety and good air pollution control practices for minimizing emissions, keep sufficient records to demonstrate compliance with manufacturer's written instructions and the maintenance requirements of Table 2d, and submit periodic reports. During the latest compliance inspection, the facility appeared to be complying the maintenance practice requirements, and continued compliance is expected.

15A NCAC 02D .1806, Control and Prohibition of Odorous Emissions

This is applicable facility wide. DAQ inspectors have not noted odors beyond the facility's property boundary, and neither DAQ nor the facility have received any odor complaints from nearby residents. Continued compliance is expected.

15A NCAC 02Q .0711: Emission Rates Requiring a Permit

The landfill (ID No. ES-1) is subject to 40 CFR 61, Subpart M, and the leachate pump (ID No. ES-2) is subject to 40 CFR 63, Subpart ZZZZ. Pursuant to 15A NCAC 02Q .0702(a)(27), sources subject to NESHAP and MACT regulations are exempt from permitting for toxic air pollutants, and the facility has requested that this permit condition be removed. The permit will no longer contain provisions regarding State toxics, however, evaluations of toxic air pollutant emissions will continue to be made as required by NCGS 143-215.107(a)(5)b. A toxics evaluation for the facility is made in Section 9 below.

8. Other Regulatory Requirements

- A Zoning Consistency Determination is NOT required for this permitting action.

- Application No. 2900373.18A was sealed by Pieter Scheer, who is a registered Professional Engineer in the State of North Carolina (Seal #021666).

- No permit application fees are required for renewal. No application fees were required for the modification application since the modification is the result of a change in regulations. DAQ decided not to charge any additional application fees for the addendum made to add the diesel-fired leachate pump.

9. Air Toxics

The facility has never triggered a dispersion modeling demonstration for toxic air pollutants in the past, although permit revision T00 does contain a 02Q .0711 condition. The facility's emission sources are subject to MACT and NESHAP regulations, and the facility has requested that all toxics conditions be removed from the permit since the emission sources are exempt from permitting for toxics under the conditions of 15A NCAC 02Q .0702(a)(27). Prior to submitting that request, the landfill requested that DAQ perform dispersion modeling for acrylonitrile, benzene, and vinyl chloride since those pollutants exceeded their respective TPERs, based on calculations using the AP-42 Chapter 2.4 (November 1998) concentrations and methods. The LFG generation rate was estimated to peak in CY2045, the anticipated end of life of the landfill, using LandGEM. The result of the LandGEM model was a total LFG generation rate of 20,842,40 m^3 per year for all three landfill areas.

When making the initial calculations the landfill assumed the default collection efficiency of 75% for the GCCS. However, emissions reported on the landfill's CY2017 AQEI exceeded the emission rates which were requested to be modeled since the collection rate of the gas being sent to the LFGTE site was approximately 57% and the rest of the generated landfill gas is assumed to have been emitted to the atmosphere. Because of this, the landfill reported that actual emissions of hydrogen sulfide also exceed the TPER in addition to acrylonitrile, benzene, and vinyl chloride in 2017. Furthermore, the emission rates reported in the AQEI were higher than the rates included in the application which were calculated at the end of life of the landfill. To account for the scenario of the LFGTE facility collecting and combusting less than 75% of the gas generated by the landfill, the emission rates were recalculated assuming the more conservative 57% LFG collection rate through the end of life of the landfill.

After the initial modeling was completed, a non-emergency diesel-fired leachate pump (ID No. ES-2) was discovered during a compliance inspection. The model was updated to include the benzene emissions from the engine driving the leachate pump.

The following example calculation is for the emission of benzene from the landfill's surface. [AP-42 Section 2.4.4 – Emissions]

- Total LFG generation rate (LandGEM) = 20,842,401 m^3/year
- Methane is only 50% of this gas stream (10,421,200.5 m^3/year)
- $Q_{Benzene}$ = Emission rate of benzene, m^3/year
- $C_{Benzene}$ = Concentration of benzene (1.91 ppmv, AP-42 default value)
- Multiplication factor for 50% methane concentration in landfill gas = 2.0
- Molecular weight of benzene = 78.11 g/gmole

$$Q_{Benzene} = 2.0 \times Q_{CH_4} \times \left(\frac{C_{Benzene}}{1\times10^6}\right) \text{ (AP-42, Equation 3)}$$

$$Q_{Benzene} = 2.0 \times 10{,}421{,}200.5 \frac{m^3}{year} \times \left(\frac{1.91 \text{ parts}}{1\times10^6}\right) = 39.81 \frac{m^3}{year}$$

The mass of benzene present in the methane was found using Equation 4 of AP-42, Section 2.4.4.

$$UM_{Benzene} = 39.81 \frac{m^3}{year} \times \left[\frac{78.11 \text{ g/gmol} \times 1 \text{ atm}}{8.205 \times 10^{-5} \frac{m^3 - atm}{gmol - K} \times 1000 \frac{g}{kg} \times (273 + 25℃) \text{ K}}\right] \times 2.2 \frac{lb}{kg}$$

$$UM_{Benzene} = 279.78 \frac{lb}{year}$$

The total emissions of benzene from the landfill after collection were calculated using AP-42 Section 2.4.4.2 Equation 5:

$$CM_P = \left[UM_P \times \left(1 - \frac{\eta_{col}}{100}\right)\right] + \left[UM_P \times \frac{\eta_{col}}{100} \times \left(1 - \frac{\eta_{cnt}}{100}\right)\right]$$

The second term of the equation accounts specifically for the portion of the collected gas that is sent to a control device. Since the collected gas is sent to a third-party facility for which toxic emissions have been separately evaluated, the second term is assumed to be zero, and only the first term which accounts for volume emissions directly from the landfill's surface is considered. Therefore, Equation 5 simplifies to:

$$CM_P = \left[UM_P \times \left(1 - \frac{\eta_{col}}{100}\right)\right]$$

Where:
CM_p = Controlled mass emissions of pollutant
UM_p = Uncontrolled mass emission of pollutant (as determined using Equations 3 and 4)
η_{col} = Collection efficiency of the landfill gas collection system, percent (57%)*

* The default AP-42 value for the collection efficiency of a GCCS is 75%, however for the purposes of this evaluation, DAQ used 57% collection efficiency since the LFGTE site has received less gas in the past, and the 57% collection rate was previously used by the landfill for emissions reported on the landfill's CY2017 AQEI.

$$CM_{Benzene} = \left[279.78\ \frac{\text{lb Benzene}}{\text{yr}} \times \left(1 - \frac{57}{100}\right)\right]$$

$$CM_{Benzene} = 120.31\ \frac{\text{lb Benzene}}{\text{year}}$$

During the most recent inspection, it was discovered that the landfill is also operating a diesel-fired leachate pump (ID No. ES-2). Actual expected toxic emissions from the leachate pump's engine were evaluated using AP-42 Chapter 3.3. Example calculation for benzene:

- Emission factor: 9.33 x 10^{-4} lb/mmBtu (AP-42 3.3-2)
- Brake-Specific Fuel Consumption: 0.415 lb fuel/hp-hr (manufacturer specification)
- Diesel Heat Value: 19,300 Btu/lb fuel (AP-42 3.3-1)
- Engine power rating: 80 hp
- Actual operating time: 150 hr/yr (based on facility logs)

$$\text{Emission Rate} = \frac{9.33 \times 10^{-4}\ \text{lb Benzene}}{\text{mmBtu}} \times \frac{0.415\ \text{lb fuel}}{\text{hp} - \text{hr}} \times \frac{19300\ \text{Btu}}{\text{lb fuel}} \times \frac{\text{mmBtu}}{10^6\ \text{Btu}} \times \frac{150\ \text{hr}}{\text{yr}} \times 80\ \text{hp}$$

$$\text{Emission Rate} = 0.09\ \frac{\text{lb Benzene}}{\text{yr}}$$

The landfill submitted a request for DAQ to model the engine's toxic emissions with emission rates projected at the maximum capacity of the engine operating for 8,760 hours per year. Those maximum emission rates were used to populate the following table.

Total emissions of toxic air pollutants from the landfill and diesel-fired leachate pump were compared to their respective TPERs:

Toxic Air Pollutant	Averaging Period	Landfill Volume Emissions	Diesel-fired Leachate Pump Emissions	Total	TPER	Modeling Required?
1,1,1-Trichloroethane (methyl chloroform)	lb/day	0.14	-----	0.14	250	No
	lb/hr	5.90×10^{-3}	-----	5.90×10^{-3}	64	No
1,1,2,2-Tetrechloroethane	lb/yr	150.24	-----	150.24	430	No
1,1-Dichloroethene (vinylidene chloride)	lb/day	4.28×10^{-2}	-----	4.28×10^{-2}	2.5	No
1,2-Dibromoethane (ethylene dibromide)	lb/yr	0.15	-----	0.15	27	No
1,2-Dicholoroethane (ethylene dichloride)	lb/yr	32.72	-----	32.72	260	No
1,3 Butadiene	lb/yr	-----	0.22	0.22	11	No
2-Butanone (MEK)	lb/day	1.13	-----	1.13	78	No
	lb/hr	4.71×10^{-2}	-----	4.71×10^{-2}	22.4	No
4-Methyl-2-pentanone (MIBK)	lb/day	0.41	-----	0.41	52	No
	lb/hr	1.72×10^{-2}	-----	1.72×10^{-2}	7.6	No
Acetaldehyde	lb/hr	-----	4.91×10^{-4}	4.91×10^{-4}	6.8	No
Acrolein	lb/hr	-----	5.93×10^{-5}	5.93×10^{-5}	0.02	No
Acrylonitrile	lb/day	0.74	-----	0.74	0.4	**YES**
	lb/hr	3.09×10^{-2}	-----	3.09×10^{-2}	0.22	No
Benzene	lb/yr	120.31	5.24	125.55	8.1	**YES**
Benzo(a)pyrene	lb/yr	-----	1.06×10^{-3}	1.06×10^{-3}	2.2	No
Carbon disulfide	lb/day	9.76×10^{-2}	-----	9.76×10^{-2}	3.9	No
Carbon tetrachloride	lb/yr	0.50	-----	0.50	460	No
Chlorobenzene	lb/day	6.22×10^{-2}	-----	6.22×10^{-2}	46	No
Chloroform	lb/yr	2.89	-----	2.89	290	No
p-Dichlorobenzene	lb/hr	2.84×10^{-3}	-----	2.84×10^{-3}	16.8	No
Dichloromethane (methylene chloride)	lb/yr	979.47	-----	979.47	1600	No
	lb/hr	0.11	-----	0.11	0.39	No
Ethyl mercaptan	lb/hr	1.30×10^{-2}	-----	1.30×10^{-2}	0.025	No
Formaldehyde	lb/hr	-----	7.56×10^{-4}	7.56×10^{-4}	0.04	No
n-Hexane	lb/day	1.25	-----	1.25	23	No
Hydrogen sulfide	lb/day	2.67	-----	2.67	1.7	**YES**
Mercury vapor	lb/day	1.29×10^{-4}	-----	1.29×10^{-4}	0.013	No
Methanethiol (methyl mercaptan)	lb/hr	1.10×10^{-2}	-----	1.10×10^{-2}	0.013	No
Tetrachloroethylene (Perchloroethylene)	lb/yr	498.79	-----	498.79	13000	No
Toluene	lb/day	8.00	6.29×10^{-3}	8.01	98	No
	lb/hr	0.33	2.62×10^{-4}	0.33	14.4	No
Trichloroethylene	lb/yr	298.78	-----	298.78	4000	No
Vinyl chloride	lb/yr	369.93	-----	369.93	26	**YES**
Xylene	lb/day	2.83	4.39×10^{-3}	2.83	57	No
	lb/hr	0.12	1.83×10^{-4}	0.12	16.4	No

The TPERs were exceeded for acrylonitrile, benzene, hydrogen sulfide, and vinyl chloride. Nancy Jones, AQAB, completed air dispersion modeling for the landfill using the emission rates listed above. Emission rates from each site were apportioned based on the individual site's LFG generation rate as provided by the landfill with 2.6% attributed to the Holly Grove landfill, 8.9% attributed to the Phase 1 landfill, and 88.6% attributed to the Phase 2 landfill, with some rounding error.

The following impacts resulted at the property boundary for emissions through CY2045:

Pollutant	Averaging Period	Concentration at Property Boundary ($\mu g/m^3$)	AAL ($\mu g/m^3$)	% AAL
Acrylonitrile	lb/hr	11.5	100	12%
	lb/day	2.42	30	8%
Benzene	lb/yr	0.113	0.12	94%
Hydrogen Sulfide	lb/day	8.73	120	7%
Vinyl chloride	lb/yr	0.346	0.38	91%

None of the emitted toxic air pollutants other than those modeled exceed their respective TPERs. The modeled toxics air pollutants did not exceed their respective AALs. Therefore, DAQ has determined that there is not an unacceptable risk to human health. In accordance with 15A NCAC 02Q.0702(a)(27), the permit will not contain conditions for 15A NCAC 02Q .0711 nor 02D .1100 since the landfill is subject to 40 CFR 61, Subpart M and the leachate pump is subject to GACT 4Z. The toxic emissions from the landfill should be periodically re-evaluated to account for potential changes to future operations or waste placement rates.

10. Emissions Review

Potential emissions before collection at peak in CY2045:

Pollutant	Landfill Volume Emissions Before Collection (tons/yr)	Leachate Pump Emissions (tons/yr)	Total (tons/yr)
PM (TSP)	-----	0.87	0.87
PM_{10}	-----	0.87	0.87
$PM_{2.5}$	-----	0.87	0.87
SO_2	-----	0.81	0.81
NOx	-----	12.38	12.38
CO	-----	2.67	2.67
VOC	5.30	1.01	6.31
Individual HAP (Toluene)	3.40	1.15×10^{-3}	3.40
Total HAP	9.93	0.01	9.94

Potential emissions after collection at peak in CY2045:

Pollutant	Landfill Volume Emissions After Collection* (tons/yr)	Leachate Pump Emissions (tons/yr)	Total (tons/yr)
PM (TSP)	-----	0.87	0.87
PM_{10}	-----	0.87	0.87
$PM_{2.5}$	-----	0.87	0.87
SO_2	-----	0.81	0.81
NOx	-----	12.38	12.38
CO	-----	2.67	2.67
VOC	2.28	1.01	3.29
Individual HAP (Toluene)	1.46	1.15×10^{-3}	1.46
Total HAP	4.27	0.01	4.28

* Assume 57% collection efficiency for LFG sent to the LFGTE facility based on annual emission inventory reporting.

The facility's historic actual emissions can be seen in the table on page one of this document.

MSW Landfill Emissions:
Landfill volume emissions were calculated using the LFG generation rate of 20,842,401 m^3/yr as calculated using LandGEM, and pollutant concentrations from AP-42 Chapter 2.4, November 1998. VOC emissions are 39% of NMOC. Post collection potential emissions were calculated by applying a collection efficiency of 57%, similar to the calculations made in Section 9 above.

Example:

- CY2024 LFG generation rate from LandGEM = 20,842,401 m^3/year (or 2,379.3 m^3/hour)
- Methane is 50% of this gas stream (1,189.65 m^3/hour)
- Q_{NMOC} = Emission rate of NMOC, m^3/hour
- C_{NMOC} = Concentration of NMOC (168 ppmv, Tier 2 value)
- Multiplication factor for 50% methane concentration in landfill gas = 2.0
- Molecular weight of NMOC (as n-hexane) = 86.18 g/gmol

$$Q_{NMOC} = 2.0 \times Q_{CH_4} \times \left(\frac{C_{NMOC}}{1\times10^6}\right) \text{ (AP-42, Equation 3)}$$

$$Q_{NMOC} = 2.0 \times 1{,}189.65 \frac{m^3}{hour} \times \left(\frac{168 \text{ parts}}{1\times10^6}\right) = 0.40 \frac{m^3}{hour}$$

The uncontrolled mass emissions of NMOC (UM_{NMOC}) was found using Equation 4 of AP-42, Section 2.4.4.2.

$$UM_{NMOC} = 0.40 \frac{m^3}{hour} \times \left[\frac{86.18 \text{ g/gmol} \times 1 \text{ atm}}{8.205 \times 10^{-5} \frac{m^3 - atm}{gmol - K} \times 1000 \frac{g}{kg} \times (273 + 25℃) \text{ K}}\right] \times 2.2 \frac{lb}{kg}$$

$$UM_{NMOC} = 3.10 \frac{lb \text{ NMOC}}{hour} = 13.59 \frac{tons \text{ NMOC}}{year}$$

To calculate the VOC component of the landfill's uncontrolled surface emissions, AP-42 states in note "c" of Table 2.4-2 that VOC emissions are 39 wt.% of the NMOC emissions, therefore:

$$UM_{VOC} = 0.39 \times 13.59 \frac{\text{tons NMOC}}{\text{year}} = 5.30 \frac{\text{tons VOC}}{\text{year}}$$

Volume emission of VOC from the landfill surface were calculated using AP-42 Section 2.4-6 Equation 5:

$$CM_P = \left[UM_P \times \left(1 - \frac{\eta_{col}}{100}\right)\right] + \left[UM_P \times \frac{\eta_{col}}{100} \times \left(1 - \frac{\eta_{cnt}}{100}\right)\right]$$

Where:
CM_p = Controlled mass emissions of pollutant
UM_p = Uncontrolled mass emission of pollutant
η_{col} = Collection efficiency of the landfill gas collection system, percent (57%)
η_{cnt} = Control efficiency of the landfill gas control flare

Only the first term is considered for emissions from the landfill surface, therefore:

$$CM_{VOC} = \left[5.30 \frac{\text{tons}}{\text{year}} \times \left(1 - \frac{57}{100}\right)\right] = 2.28 \frac{\text{tons}}{\text{year}}$$

Leachate Pump Emissions:
Emissions from the diesel-fired leachate pump (ID No. ES-2) were calculated using emission factors from AP-42 Chapter 3.3 along with fuel consumption information provided by the manufacturer.

- Emission factors (AP-42 3.3-1):
  - PM: 0.31 lb/mmBtu (AP-42 3.3-2; all particulate emissions are assumed to be $PM_{2.5}$)
  - SO_2: 0.29 lb/mmBtu (AP-42 3.3-2)
  - NOx: 4.41 lb/mmBtu (AP-42 3.3-2)
  - CO: 0.95 lb/mmBtu (AP-42 3.3-2)
  - VOC: 0.36 lb/mmBtu (AP-42 3.3-2; includes exhaust and crankcase emissions)
- Brake-Specific Fuel Consumption: 0.415 lb fuel/hp-hr (manufacturer specification)
- Diesel Heat Value: 19,300 Btu/lb fuel (AP-42 3.3-1)
- Engine power rating: 80 hp

Example (NOx):

$$\text{Emission Rate} = \frac{4.41 \text{ lb NOx}}{\text{mmBtu}} \times \frac{0.415 \text{ lb fuel}}{\text{hp} - \text{hr}} \times \frac{19300 \text{ Btu}}{\text{lb fuel}} \times \frac{\text{mmBtu}}{10^6 \text{ Btu}} \times \frac{8760 \text{ hr}}{\text{yr}} \times 80 \text{ hp} \times \frac{\text{ton}}{2000 \text{ lb}}$$

$$\text{Emission Rate} = 12.38 \frac{\text{tons NOx}}{\text{yr}}$$

Expected actual emissions for this source are expected to be much lower since facility records indicate that the pump operates roughly 150 hours per year.

11. Source Testing Information

The facility conducted Tier 2 sampling on March 25, 2019 in accordance with 40 CFR 60.754(a)(3) to demonstrate that NMOC emissions are below the threshold for which a GCCS would be required to be installed and operated. The sample resulted in a site-specific NMOC concentration of 168 ppmv as hexane. The latest results are as follows:

Emissions Year Modeled	Projected Annual Waste Acceptance Rate (Mg/Yr)	As of January 1, Current Solid Waste-in-place (Mg)	Modeled Tier 2 NMOC Emissions (Mg/Yr)
2019	136,364	2,964,991	15.8
2020	136,364	3,101,355	16.4
2021	136,364	3,237,718	17.0
2022	136,364	3,374,082	17.5
2023	136,364	3,510,445	18.0

12. Statement of Compliance

The latest compliance inspection was conducted on August 06, 2019 by Dylan Wright, WSRO. The landfill was found to be operating a stationary, non-emergency diesel-fired pump, as has been described previously in this review. A Notice of Deficiency (NOD) was issued on August 20, 2019 for operation of an unpermitted emission source. The landfill has no other negative compliance history, and this permitting action resolves that deficiency.

13. Public Notice Review

A notice of the DRAFT Title V Permit shall be made pursuant to 15A NCAC 02Q .0521. The notice will provide for a 30-day comment period, with an opportunity for a public hearing. Consistent with 15A NCAC 02Q .0525, the EPA will have a concurrent 45-day review period. Copies of the public notice shall be sent to persons on the Title V mailing list and EPA. Pursuant to 15A NCAC 02Q .0522, a copy of each permit application, each proposed permit and each final permit shall be provided to EPA.

The 30-day public notice period was from MONTH XX, 2020 through MONTH XX, 2020.

The EPA 45-day review period was from MONTH XX, 2020 through MONTH XX, 2020.

[Number of] comments were received during the public notice period and the EPA review period.

14. Comments and Recommendations

The permit modification and renewal applications for the Davidson County Municipal Solid Waste Landfill located in Thomasville, Davidson County, NC has been reviewed by DAQ to determine compliance with all procedures and requirements. DAQ has determined that this facility is complying or will achieve compliance, as specified in the permit, with all requirements that are applicable to the affected sources. The DAQ recommends the issuance of Air Permit No. 10408T01.